Space Weather Forecast

Issued on Tuesday, 21 November 2023 at 01:13 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Increasing Chance of R1 minor radio blackouts. Risk of G1 minor geomagnetic storms, peaking either Tuesday or Wednesday 21-22 Nov, due to arrival of a fast wind from a coronal hole.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was moderate, with a single M-class flare at 20/0903 UTC, emanating from the large region in the northeast of the visible disc. There are currently nine sunspot groups on the disc, all of which are in the eastern solar hemisphere. One notable complex spot resides in the southeast, with another, larger, aforementioned spot in the northeast, both continue to grow with some complexity.

Numerous filament and prominence eruptions were apparent on coronagraph imagery in the period, although the vast majority appeared far-sided or else emanated from the limbs. No Earth-directed CMEs observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: Solar winds have been at background levels throughout the period, although there was the hint of a very weak transient early in the period, probably from the CME which left the Sun on 16 Nov. The solar wind speeds have ranged between 350km/s, declining to around 300km/s. The interplanetary magnetic field rose later in the period, peaking at moderate levels at 20/1003 UTC, though the north-south component remained weak. The net result of the above solar wind measures was for Quiet geomagnetic activity throughout.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a daily chance of Moderate-class X-ray flares from current eastern solar horizon sunspot regions, perhaps rising slightly as a result of a further arrival over the eastern solar horizon.

Solar Wind / Geomagnetic Activity: Solar winds are currently at background levels, although are likely to increase to slightly elevated or elevated levels, between 450-500km/s due to the arrival of a fast wind from a coronal hole on Day 1 (21 Nov), possibly lasting into Day 2 (22 Nov) before waning and declining to background levels by Days 3 and 4 (23-24 Nov). Geomagnetic activity is currently Quiet, before the arrival of a coronal hole fast wind, with activity becoming Unsettled to Active, with a Slight Chance of a G1/Minor Storm on Day 1 (21 Nov), possibly into Day 2 (22 Nov), becoming mostly Quiet by Day 4 (24 Nov).

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

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Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	1	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	50	50	50	50
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)

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